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ABSTRACT

This study was designed to discover the answers to two general questions concerning the instrucitonal level of reading: (1) What is the percentage of word recognition that is necessary for second and fifth graders to maintain in order to achieve a certain percentage of comprenension? (2) Are those word recognition percentages the same for both groups? Twenty-five second and 25 fifth graders were randomly selected from three middle-class schools. An Informal Reading Inventory was developed and administered to each subject. The data was analyzed and median word recognition scores were computed across levels of readability for various bands of comprehension. Subjects were asked to read two comparable passages at each level, one orally at sight and the other silently by sight. The results indicated that most second and fifth graders needed to achieve a word recognition score of at least 98 or 99 percent on the oral passage in order to have an accompanying comprehension score of at least 75 percent on the silent passage. Most second graders who achieved less than 92 percent recognition had accompanying comprehension scores of less than 50 percent. Most fifth graders who achieved less than 96 percent had accompanying comprehension scores of less than 50 percent. (Author/MKM)

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CRITERIA FOR THE INSTRUCTIONAL LEVEL OF READING

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Abstract

Teachers are being encouraged more and more to individualize instruction. They are told to place the student at his instructional level and provide for his specific needs. However, the research concerning the criteria for the instructional level of reading has been somewhat contradictory.

This study was designed to discover the answers to two general questions concerning the instructional level of reading:

1. What is the percentage of word recognition that is necessary for second and fifth graders to maintain in order to achieve a certain percentage of comprehension?
2. Are those word recognition percentages the same for both groups?

Twenty-five second and twenty-five fifth graders were randomly selected from three middle-class schools. An Informal Reading Inventory was developed and administered to each subject. The data was analyzed and median word recognition scores were computed across levels of readability for various bands of comprehension.

The results indicated that most second and fifth graders needed to achieve a word recognition score of at least ninety-eight or ninety-nine per cent in order to have an accompanying comprehension score of at least seventy per cent. Most second graders who achieved less than ninety-two per cent recognition had accompanying scores of less than fifty per cent. Most fifth graders who achieved less than ninety-six per cent had accompanying comprehension scores of less than fifty per cent.

Education implications are discussed and suggestions for future research are made.

CRITERIA FOR THE INSTRUCTIONAL LEVEL OF READING

The Problem

During the past few years, more and more emphasis has been placed upon the diagnostic teaching of reading. Classroom teachers have been urged to individualize instruction and to direct their teaching towards the reading needs of their students. However, many factors inhibit the teacher from accomplishing such a goal. One of these factors, of course, is the large number of students that he is confronted with. Another is that often the teacher lacks the training and skill that is necessary to diagnose and then to develop a reading program appropriate for the needs of the students. Finally, even if the teacher had fewer students and had received adequate training in diagnosis, the confusion that exists concerning the criteria for the instructional level of reading would not permit him to place the students into material for instructional purposes with a great deal of confidence.

H. O. Beldin, in his article entitled "Informal Reading Testing: Historical Review and Review of the Research"[1], attempts to trace the history and use of the Informal Reading Inventory. As early as 1922, Clarence Truman Gray discussed the analysis of the types of word recognition errors made by children during oral reading of paragraphs on an informal reading test. Use of informal reading tests was discussed, and teachers were encouraged to utilize them in various ways. Eventually, criteria for the various levels of reading were established by Killgallon (1942)[9] and questioned by Cooper (1952)[4]. Recently, William Powell (1970)[10] presented a paper entitled "Reappraising the Criteria for Interpreting Informal Reading Inventories" in which he questioned Killgallon's criteria and suggested that there wasn't complete agreement and acceptance with any criteria. So it seems that although most reading authorities

recommend the use of the Informal Reading Inventory, the past research has not provided a consistent criteria for the instructional level.

It is with this thought in mind that the present study was undertaken. Findings concerning the criteria for the instructional level might provide classroom teachers with more confidence in the entire concept of instructional level and thereby permit them to provide a more successful reading program for their students.

The present investigation was initiated to study certain aspects of the general problem of establishing the criteria for the instructional level of reading. Three general questions were posed:

1. What is the percentage of word recognition that is necessary for second graders to maintain in order to achieve a certain percentage of comprehension?

2. What is the percentage of word recognition that is necessary for fifth graders to maintain in order to achieve a certain percentage of comprehension?

3. Are those word recognition percentages the same for both groups?

Limitations of the Study

The following limitations condition all conclusions which may be drawn from the data of this study.

1. The sample used for the study included only second and fifth grade students. Generalizations to other grade levels my only be done with caution until research has been completed at those grade levels.

2. The sample used for the study was primarily from middle class families. Generalizations to other populations composed of other than primarily middle class families may be made only with caution.

3. The readability formulas used to select the reading passages for the Informal Reading Inventory had certain limitations.

Definition of Terms

1. Comprehension is used in this study to mean a series of mental processes that require the reader to interpret on a literal level, on an inferential level, and to make critical evaluations and judgments.

2. Evaluation or Judgment Comprehension requires the student to provide responses which indicate that he has made an evaluative judgment by comparing ideas presented in the selection with external criteria provided by the teacher, by other authorities, from other written sources, or with internal criteria provided by the reader's experience, knowledge or values. In essence, evaluation is making a judgment that focuses on qualities of accuracy, acceptability, desirability, worth, or probability of occurrence.[3]

3. Evaluation of Reality or Fantasy Questions are those requiring the student to make a judgment based upon his experience that would permit him to differentiate between reading material that is based upon fantasy and material that is based upon reality.[3]

4. Evaluation of Appropriateness Questions are those requiring the student to make a judgment about the relative adequacy of different parts of the selection. An example would be "What part of the selection best describes the main character?"[3]

5. Evaluation of Fact or Opinion Questions are those requiring the student to analyze and evaluate the selection on the basis of the knowledge he has concerning the subject to determine if the author based his writing upon facts or opinions. They also require the student to evaluate the intent of the author.[3]

6. Evaluation of Worth, Desirability, and Acceptability Questions are those requiring the student to make judgments based upon his moral code or his value system.[3]

7. Inferential Comprehension requires the student to use the ideas

and information explicitly stated in the selection, his intuition, and his personal experience as a basis for conjecturing and hypothesizing. Inferences made by the student may be either convergent or divergent in nature, and he may or may not be asked to verbalize the rationale underlying his inferences.

8. Inferring Cause and Effect Relationship Questions are those requiring the student to hypothesize about the motivation of characters and their interactions with time and place. He may also be required to conjecture as to what caused the author to include certain ideas, words, characterizations, and actions in his writing.[3]

9. Inferring Character Trait Questions are those requiring the student to hypothesize about the nature of characters on the basis of explicit clues presented in the selection.[3]

10. Inferring the Main Idea Questions are those requiring the student to provide the main idea, general significance, theme, or moral which is not explicitly stated in the selection.[3]

11. Literal Comprehension (Recall) requires the student to focus on ideas and information which are explicitly stated in the selection.[3]

12. Recall of Cause and Effect Relationship Questions are those requiring the student to produce from memory explicitly stated reasons for certain happenings or actions in the selection.[3]

13. Recall of Detail Questions are those requiring the student to produce from memory facts such as the names of characters, the time of the story, or the setting of the story.[3]

14. Recall of Sequence Questions are those requiring the student to produce from memory the order of incidents or actions explicitly stated in the selection.[3]

15. Informal Reading Inventory (I.R.I.) is a diagnostic instrument used to evaluate a child's actual reading performance as he deals with

materials varying in difficulty. The technique is an informal one in that specific methods of administration are not standardized, and no norms have been established for performance to be compared with what other students can do. Instead, evaluations are made in terms of absolute standards. The student's performance is judged against virtual perfection rather than compared with what the majority of the children might accomplish if given the same task.[8]

16. Readability Formulas are mathematical formulas designed to predict the reading difficulty of reading materials.

17. Readability Level is the approximate grade level achieved by applying a readability formula to a particular piece of reading material.

18. Middle Class contains two divisions: upper-middle and lower-middle. Upper-middle class people generally have professional or executive positions and have earned a college degree. Lower-middle class people are generally white-collar clerks, neighborhood businessmen, or farmers, and live in a tract home in the suburbs. Additionally, middle-class people are generally members of clubs, P.T.A.'s, and other civic organizations.[7]

19. Word Recognition is used in the study to mean the ability that the student displays in pronouncing words during oral reading at sight.

20. Oral Reading at Sight is the reading of a selection orally without previously having read it.

Review of the Literature

Teachers are constantly being urged to diagnose and individualize instruction according to the needs of their students. In other words, place the student at his proper instructional level of reading and then teach him those reading skills that he needs. This is all well and good except that the criteria for the instructional level of reading are rather a debatable issue.

There has been some variance in the opinions of reading authorities regarding the exact percentages that should be used as the criteria for the instructional level of reading. Perhaps the earliest and most comprehensive discussion of the subject was presented by Betts.[2] His criteria of ninety-five per cent word recognition and seventy-five per cent comprehension are almost universally accepted standards for the instructional level. These criteria were a result of a doctoral dissertation conducted by Killgallon.[9] However, it is interesting to note that the major thesis of the study was not the production of criteria for the Informal Reading Inventory. Furthermore, the study only involved a sample of forty-one fourth graders whom he examined using an Informal Reading Inventory. Killgallon created a priori criteria for the establishment of the instructional level and tested his subjects. His results suggested that the most suitable percentage of accuracy for acceptable pronunciation of words was ninety-five per cent. An examination of the criteria suggested by other reading authorities usually tends to reflect Killgallon's findings.

The only experimental study designed to study the criteria for the instructional level of reading was the one done by Cooper.[4] He was one of the first to question Betts' criteria and the only one to support his views with objective evidence. His criteria are even more stringent than the standards proposed by Betts and Killgallon. His findings suggested

that at the primary level there should be a word recognition score of at least 98 percent with 70 percent comprehension, and at the intermediate level there should be a word recognition score of at least 96 per cent with 60 per cent comprehension. However, there seemed to be some experimental design problems such as examiner and material variance which cast some suspicion on his findings.

Another study which tended to support the Killgallon findings was that done by Daniels.[6] Using a modified criterion which permitted more latitude in the word recognition score (90 to 97 per cent) and an accompanying comprehension score (70 to 79 per cent), he discovered similar results.

A more recent study conducted by Powel[10] did cast some suspicion on the Killgallon-Betts criteria. Powell used a sample of 178 average-achieving students in grades one through six. The highest reading level with a comprehension score nearest the seventy per cent cutoff level was determined for each student. The lowest per cent of word recognition accuracy within the limit of seventy per cent was recorded and mean scores were computed for each grade level. The data suggested that first and second grade students could tolerate on the average an eighty-five per cent word recognition score and still maintain seventy per cent comprehension. Third through sixth grade students could tolerate ninety-one to ninety-four per cent word recognition and maintain seventy per cent comprehension.

From this brief review of the literature, one could conclude that the evidence concerning the criteria for the instructional level of reading is inconclusive and at times contradictory. It is hoped that this study will assist in clarifying the situation.

Procedures of the Study

The Population

The study was descriptive in nature and designed to investigate what percentage of word recognition second and fifth grade students needed to maintain in order to achieve a certain percentage of comprehension.

The population available for the study contained all of the second and fifth grade students in three elementary schools. For the most part the pupils came from average middle-class homes. The greatest percentage was Anglo (89%); however, there was a comparatively large percentage of Mexican-American (8%) and a very small percentage of Negroes (1%), Chinese (-1%) and Papago Indians (1%).

As a part of the school district testing program each student in the elementary schools was given the Stanford Achievement Test during the spring of the school year. The S.R.A. Primary Mental Abilities Test was also administered to first, third, and fifth graders. Table I gives the mean scores achieved by the population on each of these tests. The I.Q. mean score for the second grade was computed from test scores taken during the first year in school.

Table I. Population I.Q. and Reading Achievement Range and Mean Scores

		Sex					Wrd. Mean.		Por. Mean.		Wrd.St.Sk.	
Grade	No.	B	G	C.A.	I.Q.	Norm	Mean	Range	Mean	Range	Mean	Range
2	253	127	126	7-10	106	2.6	2.6	1.2-6.9	2.5	1.2-6.9	3.0	1.1-7.5
5	302	151	151	11-0	106	5.6	5.4	1.7-9.5	5.4	1.5-11.2	-	-

Types of Reading Programs

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Although the population was taken from three different schools, including nine second grade teachers, and ten fifth grade teachers, the reading programs were somewhat similar. The basic program was centered

around a Basal Reader approach which was often combined with a Language Experience approach at the first grade level. The latter approach was only continued at the second grade level with students who had difficulty in making normal progress. The fifth grade students had been subjected to several basal reader series, none of which had been used continuously over a period of years. Teachers had followed the program outlined in the teacher's manual only when they had felt it necessary. Second grade students had been subjected primarily to one basal series, but others had been used as supplementary material. There was seemingly more continuity and coordination in the second graders' reading program.

Samples

The samples for the study were composed of twenty-five second and twenty-five fifth grade students randomly chosen from the entire second and fifth grade population of the three middle-class schools.

The Testing Instrument

An Informal Reading Inventory (I.R.I.) was developed by the researcher using the basic model originated by Betts, but with some modifications.

Selections for the I.R.I. were chosen from various basal readers. The Spache[11] readability formula was used in choosing the primer through the third level selections, and the Dale-Chall[5] readability formula was used in choosing the fourth through the ninth level selections. Each level of readability contained two selections - one for the oral reading at sight and the other for the silent reading. Those selections chosen for each grade level were at approximately the same level of readability and of the same length and concept complexity. Care was taken to choose selections that would not contain concepts that were unfamiliar to the population chosen for the study.

Comprehension questions were developed for each selection and included the following types as described in Barrett's Taxonomy:[3]

(1) literal comprehension, (2) inferential comprehension, and (3) evaluation. The researcher chose to use questions of different types for each selection, but representative of a particular comprehension classification rather than have the same type of questions for all of the selections. The assumption was that although there were different types of questions under each major comprehension classification, those questions were measuring the same types of mental processes (literal, inferential or evaluation).

The number and types of questions selected for each level were as follows--primer and first levels of readability had five questions and the second through ninth levels had ten questions. At the primer and first levels there were two literal questions, two inferential and one requiring evaluation (judgment). For the second through ninth levels, four questions were literal, four were inferential and two required evaluation (judgment). A complete breakdown of the types of questions at each level of readability is contained in Table II.

After the I.R.I. was completed two judges, both of whom had extensive experience with the Informal Reading Inventory, were chosen to evaluate the research instrument. Answers to five questions were sought: (1) Were the selections within the interest areas of the majority of the examiners? (2) Were the concepts required to interpret the reading material within the cognitive structure of most of the examiners? (3) Were the various questions labeled correctly and did they measure the criteria suggested by the labeling? (4) Were the questions ambiguous? and (5) Were the stated answers correct?

The decisions of the two judges were very similar. No selection had to be removed because of the interest area or concept complexity, and only a few questions had to be reworded to correct the ambiguity.

Table II. Breakdown of Questions for Informal Reading Inventory

	Literal Comprehension			Inferential Comprehension			Evaluation Comprehension				
Level	R.D.	R.C.E.	R.S.	I.C.E.	I.C.T.	I.M.I.	E.W.D.	E.A.	E.F.O.	E.R.F.	Total
P	2			1		1	1				5
1	1	1		1	1		1				5
2	2	2		3	1		1			1	10
3	2	1	1	1	2	1	1			1	10
4	2	1	1	1	3		1	1			10
5	2	1	1	1	2	1	1		1		10
6	3	1		2	1	1		1	1		10
7	4			2	1	1		2			10
8	2	2		3		1	1	1			10
9	2	1	1	2	1	1		1	1		10
Totals	22	10	4	17	12	7	7	6	3	2	
Total		36			36			18			90

Key: R.D.--Recall of Details
R.C.E.--Recall of Cause and Effect Relationships
R.S.--Recall of Sequence
I.C.E.--Inferring Cause and Effect Relationships
I.C.T.--Inferring Character Traits
I.M.I.--Inferring Main Ideas
E.W.D.--Evaluation of Worth, Desirability, and Acceptability
E.A.--Evaluation of Appropriateness
E.F.O.--Evaluation of Fact or Opinion E.R.F.--Evaluation of Reality or Fantasy

Purposes and Design of the Pilot Study

A pilot study was conducted by the researcher to answer the following questions:

1. Were the reading selections of interest to the majority of the subjects?
2. Did the selections contain familiar concepts for the majority of the subjects?
3. Were the questions suitable?
4. What was the most efficient way of administering the Inventory that would result in valid findings?
5. What was the appropriate cut-off point for word recognition and comprehension so that the subjects would not have to endure too much frustration?
6. What was the coefficient of stability for the Informal Reading Inventory?

In order to accomplish the above, five second and five fifth grade students were chosen randomly from the population of the study. They were administered the I.R.I. by the researcher. The administration was repeated using the same subjects after an interval of three weeks in order to establish a coefficient of stability. Any administration procedure, selection, or question not found suitable was then discussed with the judges and appropriate corrections were made.

Administration and Scoring of the Informal Reading Inventory for the Pilot Study

The procedures for administering the I.R.I. were as follows:

1. The testing took place in a suitable room, free from noise or distraction.
2. The first few minutes were devoted to becoming acquainted with the examiner and thoroughly explaining the procedure to be

followed during the testing.

3. The administration of the I.R.I. was initiated at the primer level for both second and fifth grade subjects and continued until the researcher felt that the subject had demonstrated his ability to read various levels of readability. The testing was terminated after the student had reached his level of frustration.
4. The investigator introduced the examinee to the selection by asking him to read to find the answer to a question previously designed for that selection. The wording of the question did not contain any of the key words used in the selection and served only as a guide for the oral reading.
5. The examiner had the student read the oral selection which was typed on a card. As the student read the selection at sight (without previously having read it silently), the examiner recorded the various word recognition errors on his copy of the selection. The examiner used a modification of the coding system developed by Johnson and Kress.[8] Assistance in word recognition was given if the examiner paused for at least ten seconds in attempting to attack an unknown word, or if he sought help. Words that were given to the subject by the examiner were recorded as word recognition errors.
6. After the oral selection had been read, the investigator check the comprehension of the examinee by asking him to respond to the purpose-setting question that had been posed by the investigator before the student read orally. However, this answer was not scored as a part of the comprehension evaluation,
7. The examiner introduced the subject to the silent reading

selection by asking him to read silently to find the answer to a purpose-setting question. The wording of this question did not contain any of the key words in the selection and served only as a guide for the silent reading. During the silent reading, the examiner did not provide assistance in word recognition.

8. The reading comprehension of the subject was evaluated by the examiner by first asking him to respond to the purpose-setting question. However, the answer to that question was not considered as part of the comprehension evaluation. Following this, the subject was asked each question, and all answers were recorded exactly as stated by the subject. If the examiner felt that the subject could contribute more to the answer he would ask, "Can you tell me more?"

The procedure for scoring the Informal Reading Inventory was as follows:

1. Only the oral reading selection was used as the sample from which the word recognition percentage was computed.
2. Mispronounced words, omitted words, inserted words, words that were reversed such as be to for to be, and words given by the examiner were considered word recognition errors. However, any of these five types of errors that were corrected by the subject without assistance from the examiner were not counted as mistakes. Also, mispronounced words that were a result of the subject's dialect were not scored as a word recognition error.
3. The percentage for each word recognition error was calculated by dividing the total number of running words in the selection into one hundred, and the answer was rounded off to the nearest tenth. All errors were given equal weight.
4. The word recognition score for the oral selection was computed

by multiplying the percentage or weight for each word recognition error by the total errors. This figure was then subtracted from one hundred and rounded off to the nearest tenth.

5. Only the silent selection was utilized for computing the comprehension score.
6. All comprehension questions were given equal weight. The percentage was calculated by dividing the number of questions into one hundred. Those selections with five questions were assigned twenty per cent, and those with ten questions were assigned ten per cent.
7. The comprehension score was computed by multiplying the percentage for each question by the number of correct answers.
8. Partially correct answers were judged by the examiner and assigned a percentage.

The Pilot Study Findings and Changes Made in the I.R.I.

During the administration of the Informal Reading Inventory, the selections were evaluated for interest, familiarity of concepts, and the suitability of the questions. It was concluded by the researcher that the selections were generally of interest, and that the concepts were familiar to the majority of the subjects. However, there was some concern about the suitability of some of the questions. The criterion had been established that at least one subject had to answer a question correctly before it was judged as being suitable. There were several questions that did not meet this criterion. Also, some questions seemed to be ambiguous in their wording. Each of the doubtful questions was examined by the judges and the investigator and all necessary changes were made.

Another area of concern was in the administration of the I.R.I. The researcher had noticed that the examinees usually performed poorly on

the initial selection that they were asked to read. In order to correct this situation, it was decided to have the examinee read an oral selection and a silent selection before he actually read the first test selection. This sample selection was at the primer level of readability and was not considered as part of the actual test for scoring purposes.

After a careful examination of the pilot study test results, the judges and the researcher decided that in order to provide a testing situation that would not have the subjects performing for too long a time at their frustration level, it would be necessary to select a cut-off point. The decision was made to terminate the testing after the examinee had read two consecutive levels where either his word recognition was eighty-five per cent or less, or his achieved comprehension was fifty per cent or less. This provided a better psychological situation for the subjects and still provided the necessary information sought by the researcher.

In order to establish a coefficient of reliability for the Informal Reading Inventory, the I.R.I. was administered twice to the same pilot samples. The second administration took place three weeks after the first.

The coefficients in Table III were great enough to suggest a rather high reliability for the research instrument when measured over a span of three weeks.

Table III. Coefficients of Reliability for the I.R.I.

Grade	Sample Size	Passages Read	r W.R.	r Comp.
2	5	21	.978	.990
5	5	39	.943	.975

The Use of Other Examiners in Gathering the Research Data

In order to shorten the time needed to gather the research data, the

researcher decided to utilize two other examiners in addition to himself. Besides reducing the overall time involved, it was surmised by the investigator that the addition of two other examiners would strengthen the study by eliminating research bias in the administration and scoring of the tests.

Two female examiners were chosen from the Diagnostic Practicum class that was being taught by the researcher. They were selected on the basis of their experience and ability in administering Informal Reading Inventories and their ability to establish and maintain a good working relationship with children.

In order to provide uniformity in administering and scoring the Informal Reading Inventory the following steps were taken:

1. The researcher discussed in detail the procedures for administering the I.R.I.
2. The exact directions informing the examinee of the testing procedures were typed on a card for each examiner.
3. Both of the examiners administered the Informal Reading Inventory to three children to familiarize themselves with the I.R.I. and the procedures.
4. In order to obtain uniformity in scoring, each examiner would score his or her tests and then each of the other examiners would check the scoring. Any differences of opinion would be resolved by the three examiners.

After the sample of second and fifth grade students were randomly selected, using a table of random numbers, the subjects were randomly assigned to the three examiners for testing.

The Hypothesis for the Study

The percentage of word recognition that is necessary for second graders to achieve a certain level of comprehension is different from that for fifth graders.

Data Analysis

The objectives of this study were to determine the percentage of word recognition necessary to determine a certain level of comprehension for second and fifth grade students and to determine if there was a difference between the two. Tables IV and V provide a summation of the I.R.I. results as computed for readability levels.

Table IV. Range, Median, and Mean Scores of Word Recognition and Comprehension for Second Grade Subjects.

Level	N	W.R.Rng.	Comp.Rng.	W.R.M.	Comp.M.	W.R.$\bar{x}$	Comp.$\bar{x}$
P	25	88-100	30-100	98.5	61.4	97.7	75.2
1	25	64-100	10- 80	93.3	31.4	92.3	44.4
2	25	34-100	0- 80	93.8	31.3	83.5	38.6
3	14	82-100	15- 70	96.5	40.5	95.9	39.3
4	8	93-100	0- 65	95.5	31.5	96.9	46.9
5	6	88- 98	20- 60	89.5	40.5	94.5	39.2
6	4	92- 98	20- 55	96.5	30.5	95.6	35.0

Table V. Range, Median, and Mean Scores of Word Recognition and Comprehension for Fifth Grade Subjects.

Level	N	W.R.Rng.	Comp.Rng.	W.R.M.	Comp.M.	W.R.$\bar{x}$	Comp.$\bar{x}$
P	25	94-100	30-100	96.9	71.3	99.1	78.4
1	24	78-100	10- 90	99.6	31.4	98.1	48.8
2	24	68-100	30-100	98.2	60.5	97.6	60.4
3	21	94-100	30-100	98.6	60.9	98.0	61.7
4	20	95-100	20-100	99.2	60.8	98.9	65.0
5	25	25-100	0- 90	96.2	45.7	92.3	46.4
6	15	84-100	25- 95	96.3	65.7	95.2	64.3
7	13	94-100	25-100	97.7	51.0	97.6	57.7
8	12	93-100	25- 65	97.5	45.0	97.3	46.7
9	10	86- 99	10- 59	93.5	26.5	93.3	31.5

In order to compute the percentage of word recognition necessary to maintain a certain percentage of comprehension, median scores for both criteria were calculated across levels of readability along with the next to the lowest word recognition score. The lowest percentage of word recognition was not used because its value could include chance variation. The median rather than the mean was used since the scores were skewed, thus the median would be more representative of central tendency.

Table VI contains a summation of that information. Figures 1 and 2 tend to further clarify the information in Table VI.

Table VI. Word Recognition Percentages and Corresponding Percentage Bands of Comprehension.

	M Word Rec.%		Next to Lowest W.R.%		Lowest W.R.%	
Comp. %	2	5	2	5	2	5
90-100	98.6	98.2	92	94	90	92
80- 89	98.7	99.3	94	96	66	92
70- 79	99.5	99.4	92	92	88	78
60- 69	99.3	98.8	96	97	92	96
50- 59	96.5	97.7	92	96	73	95
40- 49	96.0	98.3	88	95	34	91
30- 39	98.0	96.8	88	89	64	79
20- 29	92.0	95.7	63	86	45	84
10- 19	74.0	--	73	100	58	81
0- 9	72.5	--	72	77	63	25

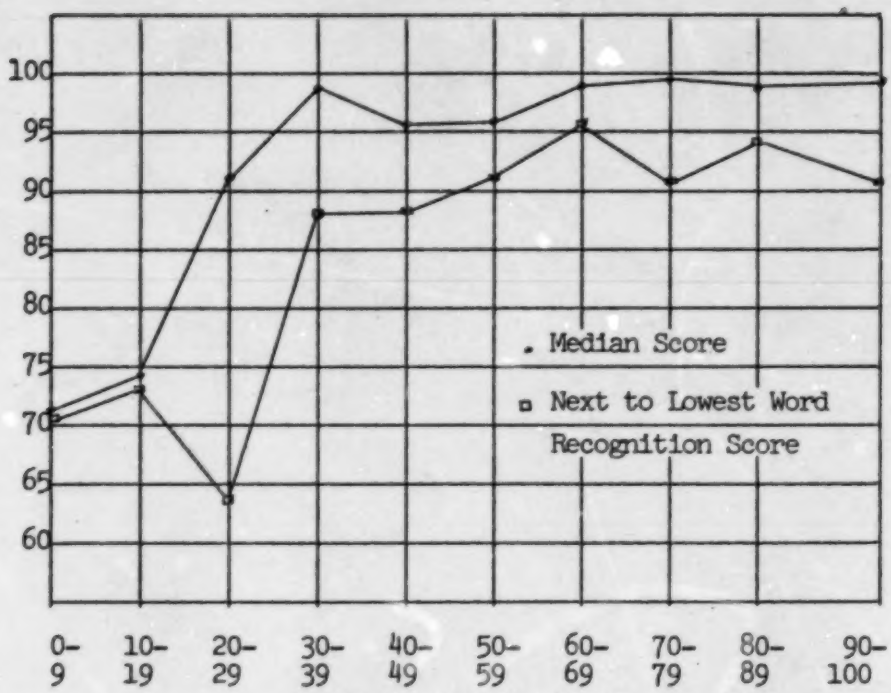

Figure 1. Percentages for Word Recognition and Comprehension for Second Grade Subjects.

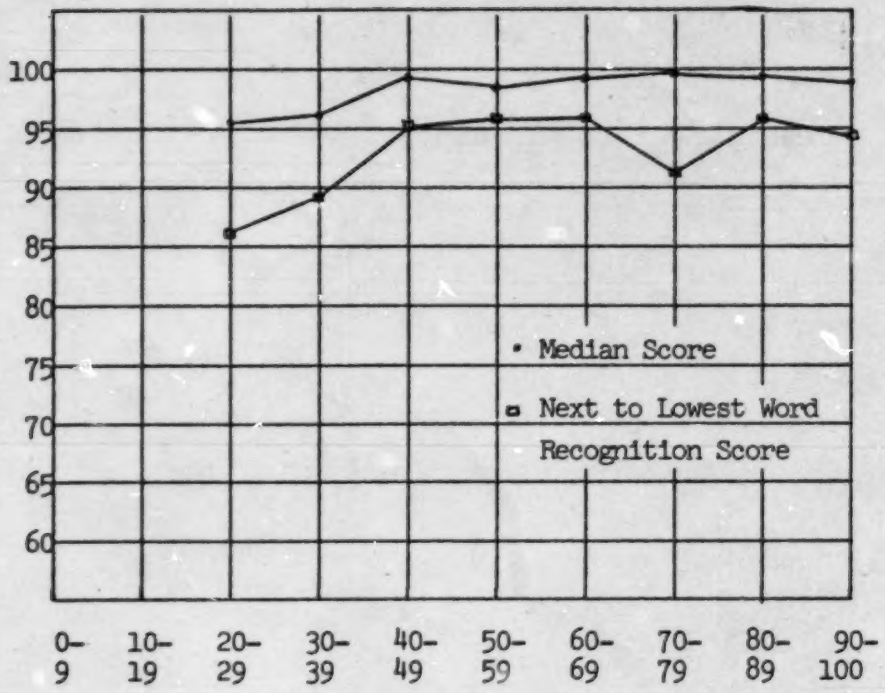

Figure 2. Percentages for Word Recognition and Comprehension for Fifth Grade Subject--Median scores for the lowest two bands of comprehension were not computed since there were only two scores for each of those bands and those scores are listed in Table VI.

The data presented in Table VI and Figures 1 and 2 indicated that there was very little difference in the median word recognition percentages for the various bands of comprehension for both second and fifth graders. This may have been partially accounted for by the fact that the medians were calculated across levels of readability rather than for each level of readability, thus ignoring the variance in difficulty among the levels.

Further examination indicated that the word recognition median for both second and fifth graders was approximately the same for the bands of comprehension extending through the fiftieth per cent band.

The next to the lowest word recognition percentage remained approximately the same for both groups of subjects until the 40-49th per cent band of comprehension. The higher percentages of word recognition maintained by the fifth graders may have reflected their superior word recognition ability.

The percentage of word recognition had very little relationship to the level of achieved comprehension for both groups of subjects. This was noticeable in Figures 1 and 2. A word recognition percentage of ninety per cent or better may have produced a comprehension score that varied between fifty and one hundred per cent. Finally, word recognition scores of less than ninety per cent usually had accompanying comprehension scores of less than fifty per cent.

Results and Conclusions

Results

(1) There was very little difference in the median word recognition percentages for the various bands of comprehension for second and fifth graders.

(2) There was very little difference in the word recognition percentage necessary for second and fifth graders to achieve a comprehension score of fifty per cent or above.

(3) Word recognition percentages of ninety per cent or higher could have just as likely been accompanied by low comprehension scores as high ones.

(4) Most second and fifth graders needed to achieve a word recognition score of at least ninety-eight or ninety-nine per cent in order to have an accompanying comprehension score of at least seventy per cent.

(5) Most second graders who achieved less than ninety-two per cent word recognition had accompanying comprehension scores of less than fifty per cent.

(6) Most fifth graders who achieved less than ninety-six per cent had accompanying comprehension scores of less than fifty per cent.

Conclusions

(1) The effect of word recognition on comprehension did not appear to change a great deal from the second to the fifth grade.

(2) High word recognition did not necessarily result in high comprehension scores.

(3) Since most second and fifth graders need to achieve a word recognition score of at least ninety-eight or ninety-nine per cent in order to have an accompanying comprehension score of seventy per cent, the practice of establishing the instructional level of reading at ninety-five per cent word recognition is questionable.

(4) The assumption made by many teachers that the child who can pronounce the words in a reading passage automatically comprehends what he reads is apparently an erroneous one.

Educational Implications

The previously discussed results and conclusions suggest the following

educational implications:

(1) Second and fifth grade students should be able to pronounce at least ninety-eight per cent of the words in material that is used for instruction in comprehension if it is felt that seventy per cent comprehension is necessary for instruction to be initiated.

(2) If fifty per cent comprehension is suitable in material that is used for instructional purposes, then second graders could have a word recognition score of as low as ninety-two per cent and fifth graders as low as ninety-six per cent.

(3) There seems to be, for instructional purposes, a word recognition band from ninety-two to ninety-nine per cent for second graders and ninety-six to ninety-eight per cent for fifth graders.

(4) The present practice of using ninety-five per cent word recognition as the criterion for the instructional level of reading is questionable.

Suggestions for Further Research

The prevailing thinking among reading authorities at this time seems to be that ninety-five per cent word recognition is the appropriate criterion for the instructional level of reading for all grade levels. Since the findings of this study seem to cast some doubt upon that belief, it would be advisable to conduct further research similar to this study at the other grade levels. The use of larger samples would possibly improve the research design.

It is the belief of this researcher that eventually experimental studies will have to be performed in order to really verify the per cent of word recognition and comprehension appropriate for the instructional

level of reading at the various grade levels. Such studies could also be designed to answer the question of what is the best comprehension percentage for instructional purposes. It seems, from an examination of the research, that seventy to seventy-five per cent is necessary. However, there are no apparent empirical findings to support such a decision.

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